UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/620,487	07/16/2003	Thomas Maier	MAIER T-2 US	3311

7590 02/17/2005

COLLARD & ROE, P.C.
1077 Northern Boulevard
Roslyn, NY 11576

EXAMINER	
ODELL, LINDSAY T	

ART UNIT	PAPER NUMBER
1652	

DATE MAILED: 02/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/620,487	MAIER, THOMAS	
	Examiner	Art Unit	
	Lindsay Odell	1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) *9-16* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10 November 2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Application Status

1. In response to the previous Office action, a written restriction requirement (mailed on October 28, 2004), Applicants filed a response received on November 24, 2004. Claims 1-16 are pending in this instant Office action.

Election

2. Applicant's election with traverse of Group I, Claims 1-8 in the reply filed on November 24, 2004 is acknowledged. The traversal is on the grounds(s) that no undue burden would be placed on the Examiner to examine all the pending claims together. This is not found persuasive because the Groups of claims are distinct for the reasons previously cited, and the searches are not co-extensive; thus, the Groups of claims would be burdensome to be searched together.

The requirement is still deemed proper, and is, therefore, made FINAL. Claims 1-16 are pending in the instant Office action. Claims 9-16 are withdrawn as non-elected inventions. Claims 1-8 are examined herein.

Priority

3. The instant application is granted the benefit of priority for the foreign application 102 32 930.3 filed in Germany on July 19, 2002 as requested in the declaration. Receipt is acknowledged of papers submitted under 35 U.S.C. § 119(a)-(d) or (f), which papers have been

placed of record in the file. Said papers are not in English, and no translation has been filed.

Thus, the earliest effective filing data considered in the instant office action is July 16, 2003.

Information Disclosure Statement

4. The information disclosure statement filed November 10, 2003 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. The following references were not considered for the reasons described below:

a) The English Derwent Abstracts 2000-648385, 1997-246368, 2002-629730, and 1999-047559, cited on pages 1 and 2 of the IDS, are redundant. The applications they correspond to are already listed on the IDS.

b) A copy of the English Derwent Abstract for DE 10219851 has not been received.

c) The citation of Nakamori *et al.*, is incomplete because the publication date is missing.

d) The listing of references for AS and AT, on page 3 of the IDS, is improper. Two references are cited for each of AS and AT. Only one reference may be cited for each designated letter group.

e) The citation of Nashimodo *et al.* is incomplete because no date or accession number is given, and no copy of Nashimodo *et al.* has been received.

f) The citation of Blattner *et al.* on page 5 of the IDS is incomplete because the date, journal and volume number are not given.

g) No copy of Franke *et al.* has been received.

All other documents in said Information Disclosure Statement were considered as noted by the examiner's initials in the attached copy.

Compliance with the Sequence Rules

5. The sequence listing, filed in computer readable form (CRF) and paper copy on July 16, 2003, and the statement regarding the sameness of the CRF and the paper copy of the sequence listing, filed on July 16, 2003, have been received and entered. Thus, the application is in compliance with the sequence rules at this time.

Objections to the Specification

6. The specification is objected to for the improper use of trademarks. The use of the trademarks "QIAQUICK", "BIOSTAT" and "LUNA" have been noted in this application. They should be capitalized wherever they appear and be accompanied by the generic terminology. Please see pages 17, 19 and 20 of the specification for instances of improper trademark use. Correction is required.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner that might adversely affect their validity as trademarks.

7. The specification is objected to because the title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: A microorganism strain transformed with the *Escherichia coli* yfiK gene for the production of amino acids.

8. The abstract of the disclosure is objected to for not completely describing the disclosed subject matter (MPEP § 608.01(b)). It is noted that in many databases and in foreign countries, the Abstract is crucial in defining the disclosed subject matter; thus, its completeness is essential. The Examiner suggests the inclusion of the source species of the protein encoded by the *yfiK* gene, *Escherichia coli*; recitation of the activity of the protein encoded by the *yfiK* gene; and the methods of using the microorganism strain, for completeness.

Objections to the Claims

9. Claim 4 is objected to because of the following informalities: an article is missing in the phrase "the group consisting of constitutive GAPDH promoter" before the word constitutive. Because promoter is the singular form of the word, an article is required to precede it. Appropriate correction is required.

Claim Rejections 35 U.S.C. § 112

The following is a quotation of the second paragraph of 35 U.S.C. § 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "phosphoglycerate family or derivatives thereof" is unclear as to the

metes and bounds it imparts on the claimed subject matter. The phosphoglycerate family of amino acids is defined on page 2 of the specification as being biosynthetically derived from 3-phsophoglyceric acid. The prior art teaches that the amino acids biosynthetically derived from 3-phoshpoglyceric acid are: serine, cysteine and glycine (Lehninger *et al.*, see PTO-892); however, neither the specification nor the prior art provide guidance as to what is meant by derivatives of the phosphoglycerate family. It is not clear whether derivatives of the phosphoglycerate family are only those derivatives that result from the 2-phosphoglycerate pathway or if they are any derivatives of serine, cysteine and glycine. In addition, it is unclear how similar a molecule must be to a member of the phosphoglycerate family of amino acids in order to be considered a derivative. Clarification is required.

11. Claims 1-5 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter, which Applicant regards as the invention. The use of the word "a" where emphasized in the phrases "activity of **a** yfiK-gene product" (emphasis added) and "increased activity of **a** gene product of a yfiK homologue" (emphasis added) is unclear as to the metes and bounds it imparts on the claimed subject matter. The word "a", where emphasized in these phrases, indicates that there is more than one kind of gene product for any given yfiK gene or yfiK gene homologue, which is confusing. One of average skill in the art would not expect more than one gene product to exist for any given yfiK gene, especially for prokaryotes, which do not have the potential for alternate-splice variants. The Examiner suggests the language ---activity of the gene product of a yfiK gene product---, and ---increased activity of the gene product of a yfiK homologue---. Clarification is required.

12. Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The terms "yfiK-gene product" and "yfiK homologue" as they appear in claim 1, and the term "yfiK gene" as it appears in claim 6, are unclear as to the metes and bounds they impart on the claimed subject matter. While the specification discloses how a "yfiK gene" and "yfiK gene product" may be characterized, and what **may** "be regarded as yfiK homologues" on pages 6-8 of the specification, explicit definitions for the terms "yfiK gene", "yfiK-gene product", and "yfiK homologue" are not provided. yfiK is an undefined acronym in the claims and has no well known meaning in the prior art. It is not clear what a yfiK gene is, what level of similarity must exist for a gene to be considered a yfiK gene or yfiK gene homologue, or what level of similarity must exist for a gene product to be considered a yfiK-gene product. Claims 2-5, dependent upon claim 1, and claims 7-8, dependent upon claim 6 do not provide any additional guidance on this issue. Clarification is required.

13. Claims 3 and 4 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter, which Applicant regards as the invention. The use of the word "a" where emphasized in the phrases "consisting of a copy number of the yfiK gene" (claim 3, emphasis added) and "wherein a promoter is selected from the group consisting of " (claim 4, emphasis added) is indefinite. It is not clear what is meant by "a" copy number of the yfiK gene in claim 3. The term "copy number" has not been defined as a specific entity (i.e. copy number 1, 2 3, 10 or 20) in the specification or the

prior art. Does Applicant mean "the" copy number? In addition, does "a" promoter in claim 4, refer to the "suitable promoters" recited in claim 3? The Examiner suggests the language: --- consisting of the copy number---, and --wherein the promoter is selected from the group--- , Clarification is required.

14. Claim 4 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter, which Applicant regards as the invention. The phrase "selected from the group consisting of constitutive GAPDH promoter of the gapA gene, inducible lac, tac, trc, lamda, ara and tet promoters" is confusing. It is not clear whether or not the group consists only two entities or if it consists of seven entities. The claim language indicates that the first group is the constitutive GAPDH promoter of the gapA gene, and the second group is inducible promoters (lac, tac, trc, lambda, ara and tet). Does Applicant mean to include seven groups, including one for each of the inducible promoters? The Examiner suggests the language: ---selected from the group consisting of the constitutive GAPDH promoter of the gapA gene and each of the following inducible promoters: lac, tac, trc, lamda, ara and tet---. Clarification is required.

15. Claim 5 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter, which Applicant regards as the invention. The term "pACYC derivative" is unclear as to the metes and bounds it imparts on the claimed subject matter. The specification does not provide a definition for the term "pACYC derivative", nor is the term clearly defined in the art with a single meaning. While the

prior art provides guidance as to what constitutes a pACYC vector, it is not clear from the specification or the art how similar a molecule must be to pACYC to be considered a pACYC derivative. Clarification is required.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

16. Claims 1-8 are rejected under 35 U.S.C. § 112, first paragraph, written description, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 1, upon which claims 2-5 depend, is drawn to a microorganism strain having an increased activity of a yfiK-gene product or homologue. Claim 6, upon which claims 7-8 depend, is drawn to any plasmid containing a yfiK gene. In the instant claims, the yfiK gene product is named, but neither structural nor functional characteristics are given as claim limitations.

The Court of Appeals for the Federal Circuit has recently held that a "written description of an invention involving a chemical genus, like a description of a chemical species, 'requires a precise definition, such as be structure, formula [or] chemical name,' of the claimed subject matter sufficient to distinguish it from other materials." University of California v. Eli Lilly and Co., 1997 U.S. App. LEXIS 18221, at *23, quoting Fiers v. Revel, 25 USPQ2d 1601, 1606 (Fed. Cir. 1993) (bracketed material in original). To fully describe a genus of genetic material, which

is a chemical compound, applicants must (1) fully describe at least one species of the claimed genus sufficient to represent said genus whereby a skilled artisan, in view of the prior art, could predict the structure of other species encompassed by the claimed genus and (2) identify the common characteristics of the claimed molecules, e.g., structure, physical and/or chemical characteristics, functional characteristics when coupled with a known or disclosed correlation between function and structure, or a combination of these.

On pages 17-18 of the instant specification, an *Escherichia coli* strain (strain W3110) is described that has been transformed with vector pG13. pG13 is vector pACYC184-cysEX-GAPDH containing the *E. coli* yfiK gene (SEQ ID NO: 1), which encodes the yfiK gene product (SEQ ID NO: 2). The apparent function of this microorganism and of the pG13 plasmid (disclosed on pages 5 and 19-23 of the specification) is to increase the fermentative production of N- and O-acetyl-serine and L-cysteine by increasing the amount of the yfiK gene product. The description of this one species of the yfiK gene product is adequate. However, the structure and function of a representative number of species of the claimed genus, as well as the common characteristics that define the structure of said genus, are not adequately described. Without adequate description of the correlation between structure and function, the structure and function of all yfiK gene products or homologues with increased activity in a microorganism strain and all plasmids containing a yfiK gene included in the scope of the claims cannot be predicted.

The limitation set forth in claim 7 that a plasmid containing a yfiK gene must additionally contain a genetic element for deregulation of cysteine metabolism also lacks adequate written description because the genus is not described by common characteristics. The single described species of the instant genera of plasmids, pG13, described above, contains cysEX, a genetic

element for deregulation of cysteine metabolism; the structure and function of cysEX, as it appears in pACYC184 (it is mutated), is known in the art. However, the structure of a representative number of species of the instant genus of plasmids with genetic elements for the deregulation of cysteine metabolism, as well as the common characteristics that define the structure of the instant genus, are not adequately described in the specification or the art.

One of skill in the art would be unable to predict the structure of other members of the instant genera of microorganism strains with an increased activity of a yfiK-gene product and plasmids containing the yfiK gene, optionally having a genetic element for deregulation of cysteine metabolism, by virtue of the instant disclosure. Therefore, claims drawn to the instant genera of microorganism strains and plasmids are also not adequately described.

17. Claims 1-8 are rejected under 35 U.S.C. 112, first paragraph, scope of enablement, because the specification, while being enabling for a microorganism transformed with a yfiK gene encoding SEQ ID NO:2 and a plasmid containing the cysteine metabolism gene cysEX and a yfiK gene encoding SEQ ID NO: 2, does not reasonably provide enablement for the genera of a microorganism having an increased activity of any yfiK-gene product, as set forth in claims 1-5, or a plasmid containing any yfiK gene, as set forth in claims 6 and 8, optionally having any genetic element for deregulation of cysteine metabolism, as set forth in claim 7. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims. The ability to make all the microorganisms having increased yfiK-gene product activity and all the

plasmids containing the yfiK gene and/or genetic element for deregulation of cysteine metabolism included in the scope of these claims would require undue experimentation.

The factors to be considered in determining whether undue experimentation is required are summarized In re Wands 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988). The Court in Wands states: "Enablement is not precluded by the necessity for some experimentation such as routine screening. However, experimentation needed to practice the invention must not be undue experimentation. The key word is 'undue,' not 'experimentation.' " (Wands, 8 USPQ2d 1404). Clearly, enablement of a claimed invention cannot be predicated on the basis of quantity of experimentation required to make or use the invention. "Whether undue experimentation is needed is not a single, simple factual determination, but rather is a conclusion reached by weighing many factual considerations." (Wands, 8 USPQ2d 1404). The factors to be considered in determining whether undue experimentation is required include: (1) the quantity of experimentation necessary, (2) the amount or direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims. While all of these factors are considered, a sufficient amount for a prima facie case is discussed below.

The instant specification teaches SEQ ID NO: 1, a DNA encoding *E. coli* yfiK (SEQ ID NO: 2), which has been subcloned into a plasmid containing the cysteine metabolism deregulation element cysEX, and transformed into *E. coli*. The specification fully enables a plasmid (or a microorganism containing a plasmid) encoding SEQ ID NO: 2 and containing cysEX; however, the specification contains no examples of yfiK genes or homologues other than

E. coli yfiK (SEQ ID NO: 1) and no examples of a genetic element for the deregulation of cysteine metabolism other than cysEX. While the instant specification describes and enables means for identifying other yfiK genes and homologues based on sequence alignment, and the art describes and enables means for identifying cysteine metabolism deregulation elements other than cysEX, these methods do not enable one of skill in the art to make all, or a relevant portion of the yfiK genes or cysteine metabolism deregulation elements included within the scope of the claims. The ability to find a yfiK gene or a cysteine metabolism deregulation element is not equivalent to the ability to make a yfiK gene or a cysteine metabolism deregulation element as required by the statute (i.e., "make and use").

In addition, the nature of the invention is such that the genus of yfiK-gene products included in the scope of the claims must have increased activity; however, guidance as to the activity of said genus of yfiK-gene products is not provided in the art or the specification. The predictability of making all the microorganisms included in the scope of the claims that have increased yfiK gene product activity is extremely low for the following reasons: the activity of the claimed genus of yfiK gene products and how that activity relates to the structure of the claimed genus is unknown. In conclusion, one of skill in the art would be unable to predict the structure of the members of the instant genera in order to make such members. Therefore, the instant claims are not enabled to the full extent of their scope.

Claim Rejections 35 U.S.C. § 101

35 U.S.C. § 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

18. Claims 1-3 are rejected under 35 U.S.C. § 101 because the claimed inventions are directed to non-statutory subject matter. The claims, as written, do not sufficiently distinguish over microorganisms as they naturally exist because the claims do not particularly point out any non-naturally occurring differences between the claimed products and the naturally occurring products. The claims are drawn to microorganism strains having increased activity of a yfiK gene product or homologues, thereof (claims 1 and 2), optionally having an increase in said activity because of an increase in the copy number of the yfiK gene or because of the use of suitable promoters of translation signals (claim 3). Although microorganism strains with an increase in the activity of a yfiK gene product may be created in the laboratory, they may also occur naturally. Natural gene duplication events can result in an increase in copy number of the yfiK gene, and, subsequently, an increase in yfiK gene product activity. In addition, naturally occurring mutations in a promoter or translation signal can be said to be "used" by a microorganism to increase yfiK gene expression. It is not clear from the claims that the microorganism strains having an increase in yfiK gene product activity are only those engineered in the laboratory. In the absence of the hand of man, the naturally occurring products are considered non-statutory subject matter. See Diamond v. Chakrabarty, 447 U.S. 303, 206, USPQ 193 (1980). The claims should be amended to indicate the hand of the inventor, e.g. by

insertion of "transformed with the *E. coli* yfiK gene" as taught on pages 17-18 of the specification. ~~See M.P.E.P. § 2105~~. See M.P.E.P. § 2105.

KK
2/4/05

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

19. Claims 1-8 are rejected under 35 U.S.C. § 102(a) as being anticipated by Franke *et al.* (see PTO-892). The instant claims are drawn to an *E. coli* strain suitable for fermentative production of amino acids of the phosphoglycerate family transformed with a pACYC derivative that contains the yfiK gene under control of the constitutive GAPDH promoter of the gapA gene, wherein the activity of the yfiK-gene product (SEQ ID NO: 2) is increased by expression of the yfiK gene. The instant claims are also drawn to a plasmid containing a yfiK gene, a promoter and a genetic element for deregulation of cysteine metabolism; and to methods of introducing a plasmid containing a yfiK gene and a promoter into a microorganism.

Franke *et al*. teach the *E. coli* yfiK gene in plasmid pG7, which contains the constitutively active promoter of the *E. coli* gapA gene and the cysEX gene, a genetic element for deregulation of cysteine metabolism (page 1163, column 1). Franke *et al.* also teach transformation of plasmid pG7 into *E. coli* in order to increase expression of the yfiK gene and to carry out fermentative production of *O*-acetylserine and cysteine (page 1163, columns 1-2). The

E. coli strain taught by Franke *et al.* is clearly suitable for fermentative production of amino acids of the phosphoglycerate family because, when grown, it produces cysteine, a member of the phosphoglycerate family of amino acids. In addition, in the broadest reasonable possible interpretation of the claims, plasmid pG7 can be considered a pACYC derivative because no guidance is given in the specification or the art as to what constitutes a pACYC derivative (see 112, 2nd paragraph rejection for the term "pACYC derivative"). Franke *et al.* have, therefore, anticipated every aspect of claims 1-8.

If foreign priority document 10232930.3 filed in Germany on July 19, 2002 teaches the above inventions, Examiner suggests that a certified translation of said document be provided to the Office in order to overcome the instant rejection.

20. Claims 1-6 and 8 are rejected under 35 U.S.C. § 102(b) as being anticipated by Livshits *et al.* (EP 1016710, see IDS) as evidenced by Maier (PGPubs Document 20040038352, see PTO-892). The instant claims are drawn to a microorganism suitable for fermentative production of amino acids of the phosphoglycerate family transformed with a pACYC derivative that contains the yfiK gene under control of an inducible *lac* promoter wherein the activity of the yfiK-gene product (SEQ ID NO: 2) is increased by expression of the yfiK gene. The instant claims are also drawn to any plasmid that contains a promoter and a yfiK gene and methods of transformation of said plasmid.

Livshits *et al.* teach *E. coli* transformed with plasmid pYFIK, which is a multi-copy vector containing the *E. coli* yfiK gene, and methods of making said *E. coli* (page 7, paragraph 0053). Livshits *et al.* also teach using promoters such as the *lac*, *trc* and *tac* promoters, and the

lamda phage promoters P_R and P_L to enhance expression of the yfiK gene (page 4, paragraph 0022-0024). The microorganism taught by Livshits *et al.*, therefore, has an increased activity of the yfiK gene (page 3, paragraph 0016).

Livshits *et al.* have anticipated claims 6 and 8 because they have taught a plasmid that contains the yfiK gene and a promoter, and a method for transforming it into a starting strain.

Livshits *et al.* have also anticipated claims 1-5 because, in the broadest reasonable interpretation of the claims, the *E. coli* strain used by Livshits *et al.* is suitable for fermentative production of amino acids of the phosphoglycerate family, and is producible from a starting strain, as required by claim 1. The strain taught by Livshits *et al.* has been transformed with a vector, making it producible from a starting strain. In addition, the *E. coli* strain taught by Livshits *et al.* is suitable for fermentative production of amino acids in the phosphoglycerate family because *E. coli* bacteria have a biosynthetic pathway for amino acids of the phosphoglycerate family, as evidenced by Maier, who teaches utilizing *E. coli*'s biosynthetic pathway to produce of amino acids of the phosphoglycerate family. Since the *E. coli* strain taught by Livshits *et al.* has not been genetically modified to be auxotrophic for amino acids of the phosphoglycerate family, it does not require these amino acids to be supplied when it is grown, but makes them. Because the strain taught by Livshits *et al.* makes the amino acids of the phosphoglycerate family, it is suitable for fermentative production of these amino acids. Lastly, the plasmids taught by Livshits *et al.* can be considered pACYC derivatives because no guidance is given in the specification or the art as to what constitutes a pACYC derivative (see 112, 2nd paragraph rejection for the term "pACYC derivative"). Therefore, in the broadest

reasonable possible interpretation of the claims, the plasmids taught by Livshits *et al.* are pACYC derivatives, and Livshits *et al.* have anticipated every aspect of claims 1-5.

In conclusion, Livshits *et al.* meet every limitation of claims 1-6 and 8 because they have taught increasing yfiK-gene product activity in the aforementioned strain (as required by claims 1 and 2) by transforming yfiK in a multi-copy vector (which meets the limitations set forth in claims 3, 6 and 8), said vector having certain promoters (as required by claim 4) and being a pACYC derivative (as required by claim 5).

Other Art for Comment

21. The following are cited to complete the record:

Blattner *et al.* (see PTO-892) and Oshima *et al.* (see PTO-892) are publications concerning sequencing (not expression) of the *E. coli* yfiK gene (SEQ ID NO: 1). Neither Blattner *et al.* or Oshima *et al.* ascribe a function to the yfiK gene, nor do they teach expression of yfiK to increase activity of the yfiK gene product in a microorganism so that fermentative production of amino acids of the phosphoglycerate family is increased.

Conclusion

22. Claims 1-8 are rejected for the reasons identified in the numbered sections of the Office action. Applicants must respond to the objections/rejections in each of the numbered sections in the Office action to be fully responsive in prosecution.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lindsay Odell whose telephone number is 571-272-3445. The examiner can normally be reached on M-F, 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ponnathapura Achutamurthy can be reached on 571-272-0928. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LO
January 26, 2005

KATHLEEN KERR, PH.D.
PRIMARY EXAMINER